REMARKS

The above amendments to the above-captioned application along with the following remarks are being submitted as a full and complete response to the Official Action dated August 27, 2007 and the telephone interview with the Examiner on November 20, 2007. Applicants thank the Examiner for taking the time to conduct the telephone interview.

In view of the above amendments and the following remarks, the Examiner is respectfully requested to give due reconsideration to this application, to indicate the allowability of the claims, and to pass this case to issue.

Interview Summary

After Applicants' explanation, the Examiner agreed that the 112 rejections were overcome. Regarding the prior art rejection, the Examiner understood the point of the novelty, but has to formally review Ohya, and do another prior art search, if necessary.

Status of the Claims

Claims 1-20 are under consideration in this application. Claims 1, 7 and 11 are being further amended, as set forth in the above marked-up presentation of the claim amendments, in order to correct a minor formal error and to more particularly define and distinctly claim Applicants' invention. A new claim 20 is being added. Applicants hereby submit that no new matter is being introduced into the application through the submission of this response.

Allowable Subject Matter

Claims 5-6, 9-10, and 17 would be allowed if rewritten to overcome the §112 rejection, and into independent form to include all limitations of the base claim and any intervening claims.

Formal Rejections

The Examiner rejected claims 1-19 under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement and the enablement requirement.

Regarding the limitation of 'comparing the first image feature with the second image feature to determine a level of similarity there between without breaking down the first and second image features into separate characters (p. 2, lines 14-19 of the outstanding Office Action),' Applicants contend that it is supported at least on page 4, lines 6-8: '*As this*

method [of the present invention] identifies a character region containing the image of a string of characters, i.e., a character string image (instead of individual characters) and detects the character region on the basis of the shape of the character string image,....', and on page 7, last paragraph: "*As characters searched according to the invention are matched with such a character string image instead of character-by-character matching based on codes in the prior art, no cutting out of each individual character is required. Therefore, the invention is hardly susceptible to the influence of the precision of cutting out.*"

As to the support for Examiner's argument that the invention does not teach breaking down character images per character (p. 2, last four lines of the outstanding Office Action): the extracting of (i.e., breaking down) characters regions (p. 9, 2nd paragraph; p. 11, lines 5-11; p. 14, 1st paragraph) for comparison (p. 16, 1st paragraph), Applicants contend that these description are relevant the steps occurring prior to the comparing without breaking down per character step of the independent claims, such as "detecting a character region in the first image based upon a shape thereof," "extracting a first image feature of the character region, said first image feature containing image sub-features of a character string," etc.

The description on page 9, 2nd paragraph, is about an anti-aliasing process for an analog signal image. The description on page 11, lines 5-11, is about extraction of lines with a width in a specific range and extraction of a concentrated region of such lines. The description on page 14, 1st paragraph, is about extraction of a concentrated region of lines with a width in a specific range. These descriptions teach how to find a character region in an image, rather than breaking down the character image per character as asserted by the Examiner. In particular, the process described above is to find a character region in an image and just to extract lines with a width in a specific range or to extract a concentrated region of such lines, because the extracted region has a high possibility of having characters. In this way, a region having characters are extracted, but each character is neither identified nor broken down per character, as in the present invention. Therefore, the claim limitation was fully supported by the specification.

Regarding the enablement rejection, Applicants contend that Figs. 10-11 and the following descriptions fully enable the comparing without breaking per character step: page 10, 1st paragraph, page 16, line 1 to page 17, line 3, Figs. 2-3 & 11, etc. In particular, Fig. 11 shows that the character images are compared based upon calculated similarity percentages 704, such as 98%, 91%, 88%, 47%, which were calculated in step 304 of Fig. 3.

The invention "*uses a one-dimensional feature string, for matching 2D character images in which the number of vertical "edges" is counted once wherever the luminance changes in a predetermined way, such as from 0→1, at a predetermined density and the numbers are arrayed horizontally as shown in Fig. 10* (p. 16, lines 12-15)".

The character image region so extracted is then "*subjected to the calculation of similarity to the features of the user-entered character string (step 303), i.e. feature matching (p. 16, last paragraph). For this purpose, elastic matching in only one dimension is sufficient. As a method of one-dimensional elastic matching, one of various high speed techniques, typically represented especially the DP (dynamic programming) matching, can be applied as a method of one-dimensional elastic matching* (p. 16, last paragraph)".

As indicated, the claims are fully supported and enabled by the specification. Accordingly, the withdrawal of the outstanding informality rejections is in order, and is therefore respectfully solicited.

Prior Art Rejections

The Examiner still rejected claims 1, 2-4, 7-8, 11-14, 16 and 18-19 under 35 USC § 103(a) as being unpatentable over an article entitled "Recognizing Characters in Scene Images" by Ohya et al. (hereinafter "Ohya") in view of US Pat. No. 6,751,603 to Bauer et al. (hereinafter "Bauer"), and claim 15 over Ohya and Bauer in view of an article entitled "A Method for Recognizing Character Strings from Maps Using Linguistic Knowledge" by Akira et al. (hereinafter "Akira"). These rejections have been carefully considered, but are most respectfully traversed, as more fully discussed below.

It appears that the Examiner cited prior art Ohya and Bauer without considering the allegedun-supported claim limitation (p. 5, lines 3-4 of the outstanding Office Action): "without breaking down the first and second image features per character into separate characters". As the claim limitation is fully supported by the specification as discussed above, Applicants respectfully request the Examiner to give due consideration to the claim limitation.

The method for searching at least one character string image embedded in an image having separate characters of the invention (for example, the embodiment depicted in Figs. 3 & 11), as now recited in claim 1, comprises: providing a first image (e.g., 701 in Fig. 11 or 800 in Fig. 12 embedded with a character string "大統領選　混迷续く"); detecting a character region 702 in the first image based upon a shape thereof; extracting a first **image**

feature (e.g., the image of "大使館" in a box 703) of the character region 702, said first image feature containing image sub-features of a character string (step 206 "Extract Character String Feature" in Fig. 2; "*image features of a character string, are extracted (step 206)*" p. 9, lines 14-15; e.g., claims 5-6); receiving an input of a *character string* of interest by a user (e.g., "大統領" in a text input region 706 for keyword entry in font GOTHIC in Fig. 11; p.7, line 17); generating a second image of said ***character string*** of interest (Step 302 in Fig. 3); extracting a second **image** feature (e.g., the image of "大統領") from the second image (Step 303 in Fig. 3), said second image feature containing image sub-features of said character string of interest; comparing the first image feature (of the character string) with the second image feature (of said character string of interest) to determine a level of similarity (e.g., 47%) (Step 304 in Fig. 3) therebetween without breaking down the first and second image features per character into separate characters (p. 4, lines 6-8; Figs. 6-7 & 9 show the extracting flowcharts are performed without breaking the character sting image per character into separate characters; "*the invention uses a one-dimensional feature string, for* matching *2D character images...as shown in Fig. 10... the image features of a character string are expressed in the one-dimensional feature string*" without breaking them per character into separate characters, p. 16, 2nd paragraph; 700 in Fig. 11 shows the whole 1st character string as "大統領選　混迷続く" and the whole 2nd character string as "大統領" in a text input region 706 without breaking them per character into separate characters); and outputting the character region 702 or the first image 701 comprising the character region 702 based on the level of similarity.

The invention recited in claim 7 is directed to an apparatus for searching character string images in an image according to the method recited in claim 1.

The invention recited in claim 11 is directed to a program stored on a computer readable medium for processing of a character search in an image according to the method recited in claim 1.

Claim 20 recites that the first and second image features are elastically and one-dimensionally extracted and then compared ("*one-dimensional elastic matching*" p. 16, last paragraph).

Applicants respectfully contend that none of the cited references teaches or suggests a step of "comparing the first image feature (of the character string) with the second image

feature (of said character string of interest) to determine a level of similarity (e.g., 47%) therebetween without breaking down the first and second image features per character into separate characters" as in the present invention.

In contrast, Ohya compares the first image feature of the character string with the second image feature of said character string of interest by breaking down the second image feature into separate characters/categories stored in a dictionary (p. 215, 2nd paragraph). Ohya (p. 219) only accepts image patterns including only ONE character, i.e., (e.g., "U," "C," etc.) in the dictionary, rather than a character string which includes at least two characters ("US," "83," etc.). As shown in Fig. 6, "U," "C," etc. are marked as "H-Selected as high similarity pattern" and "O-correct selection," while "US," "83," etc. are marked as "L-Rejected as low similarity pattern" and "*-correct reject." It is well established that a rejection based on cited references having contradictory principles or principles that teach away from the invention is improper.

In contrast to the prior art (p. 2, lines 1-20), the present invention is advantageous in that it does not need to perform character recognition in order to match the user-input with a section of the image, such that no recognition dictionary or language-based knowledge database is necessary. The user simply inputs a character string, which is converted into a second image by the invention, and extracts "the second image feature" therefrom to match with a character string image. The invention requires neither a dictionary for recognition nor language-based knowledge database. Moreover, the invention provides a high degree of accuracy in searching a character string of interest as entered by a user.

Applicants respectfully contend that none of the cited references teaches or suggests a step of "generating a second image of said *character string* of interest [entered by the user]" as in the present invention.

In particular, Ohya describes in its abstract that "[a] character recognition process selects patterns with high similarities by calculating the similarities between character pattern candidates and the standard patterns in a dictionary. As noted in the disclosure of the present invention, the prior art as described in Ohya is recognized and distinguished on page 2, line 9 to page 3, line 14. Ohya as does the prior art in general needs a dictionary; a dictionary has to be prepared for each language. Also, Applicants have found that detecting words from an image, as is done in the prior art, is sometimes difficult, as the words are on the image and contrast for purposes of detecting the words is mixed.

As such, Applicants will strongly but respectfully contend that Ohya by itself fails to disclose, teach or suggest any combination of features that embody a structure or operation in which a first image is provided; a character region in the first image is detected based upon a shape thereof; a first image feature of the character region is extracted, said first image feature containing image sub-features of a character string having separate characters; an input of a character string of interest is received from a user; a second image of said character string of interest is generated; a second image feature is extracted from the second image, said second image feature containing image sub-features of said character string of interest; the first image feature with the second image feature are compared to determine a level of similarity without breaking down the first and second image features per character into separate characters; and the character region or the first image comprising the character region based on the level of similarity is outputted.

Bauer was relied upon by the Examiner to teach "searching string image" entered by a user. Contrary to the Examiner's assertion, Bauer merely discloses a conventional data file selection method, wherein data files to be searched includes pictures (see column 5, lines 45-57 and 43-4), and data files are selected by a character string input by the user (see column 2 lines 32-35). Bauer falls far short of providing any disclosure, teaching or suggestion that would make up for the deficiencies in Ohya such that their combination could embody all the features of the present invention as claimed.

Applicants again respectfully contend that one skilled in the art would not be motivated to combine Ohya with Bauer in the ways suggested by the Examiner. The alleged reason to incorporate Ohya into Bauer or Bauer into Ohya is simply improper.

With respect to Akira, Applicants will again point out that this reference only relates to how to recognize characters from the map, and fails to compensate for the deficiencies in Ohya, Bauer and their combination.

Applicants will strongly but respectfully contend that none of the cited references or their combinations teaches or suggests each and every feature of the present invention as recited in independent claims 1, 7 and 11. As such, the present invention as now claimed is distinguishable and thereby allowable over the rejections raised in the Office Action. The withdrawal of the outstanding prior art rejections is in order, and is respectfully solicited.

Conclusion

In view of all the above, clear and distinct differences as discussed exist between the present invention and the prior art references upon which the rejections in the Office Action rely, Applicant respectfully contends that the prior art references cannot anticipate the present invention or render the present invention obvious. Rather, the present invention as a whole is distinguishable, and thereby allowable over the prior art.

Favorable reconsideration of this application is respectfully solicited. Should there be any outstanding issues requiring discussion that would further the prosecution and allowance of the above-captioned application, the Examiner is invited to contact the Applicants' undersigned representative at the address and telephone number indicated below.

Respectfully submitted,

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